MISSOURI MONTHLY VITAL STATISTICS

Provisional Statistics

From The

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Focus. . . Causes of Infant Mortality for the 1994-1999 Missouri Resident Birth Cohort

Infant mortality has declined from 77.8 per 1,000 live births in 1915 to 7.2 for the year 2000. Many of the infant deaths at the beginning of the twentieth century were associated with infections (e.g. diarrhea and enteritis, influenza and pneumonia, bronchitis & bronchopneumonia and whooping cough).[1] The advent of better sanitation (including safe milk), vaccinations, and antibiotics have helped reduce infant mortality due to these and other infectious conditions.

The National Infant Mortality Surveillance (NIMS) groupings of underlying causes of death[2] was used to acquire a better understanding of causes of infant mortality at the end of the twentieth century. Missouri resident infant deaths for the 1994-1999 birth cohort was the examined population. Because of small numbers for some of the causes of death groupings, six years of deaths were used. The NIMS death groupings are: perinatal conditions (referring to the time of disease onset rather than the age of death), infections (both perinatal and other), congenital anomalies, injuries, sudden infant death syndrome (SIDS), cardiac or respiratory arrest and other nonspecific or unknown causes, and all other causes (e.g. neoplasm, endocrine and immunity diseases, and diseases of the nervous system). Maternal race and infant birth weight were also reviewed to acquire insight into the relationship of the NIMS groupings with these factors. For race, white and black racial groups were reviewed because of the small percent of infant deaths represented by other races (2 percent) and the fact that their outcomes are close to those of white mothers.

Also of interest is the fact that infant deaths with perinatal conditions noted as the underlying cause increased from 33.0 percent for 1994 births to 41.6 percent for 1999 births, while SIDS decreased from 13.9 to 8.7 percent for the same years. The number of infant deaths for a given year's births varied from 531 to 576 over the six year period.

Table 1 shows that perinatal conditions (e.g., prematurity, low birth weight, respiratory distress syndrome, broncho-pulmonary dysplasia, birth trauma-hypoxia-asphyxia) accounted for over one-third of infant deaths and nearly two-thirds of very low birth weight (VLBW, less than 1500 grams) infant deaths. The next major category is congenital anomalies which accounted for nearly one-quarter of infant deaths and over one-half for those infants of moderate low birth weight (MLBW, 1500 – 2499 grams). The third major category, sudden infant death syndrome (SIDS), accounted for 13.2 percent of all infant deaths. However SIDS was the number one cause of death for not-LBW (greater than or equal to 2500 grams) infants accounting for nearly 30 percent of the infant deaths for this group.

Table 1 also shows that the distribution of NIMS categories of infant deaths are not the same for the infants of white and black women. Forty-five percent of deaths to infants of black women have perinatal conditions noted as the underlying cause of death versus less than

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Table 1. Percent of Infant Deaths by Birth Weight, Race and Underlying Cause: 1994-1999 Missouri Resident Birth Cohort

	All Infant Deaths		V L B W		M L B W		Not - L B W	
Cause of Death	Number	Percent	Number	Percent	Number	Percent	Number	Percent
All Races								
Perinatal Conditions	1,224	36.2	1,078	66.1	61	11.6	75	6.2
Infections	195	5.8	102	6.3	26	4.9	67	5.6
Congenital Anomalies	836	24.7	220	13.5	267	50.7	344	28.6
Injuries	108	3.2	2	0.1	16	3.0	90	7.5
SIDS	447	13.2	11	0.7	78	14.8	357	29.7
Cardiac-Resp Arrest, Unk	222	6.6	138	8.5	20	3.8	62	5.2
Other	350	10.3	81	5.0	59	11.2	208	17.3
All Causes	3,382	100	1,632	100	527	100	1,203	100
Black								
Perinatal Conditions	472	45.0	433	71.1	17	12.1	20	6.7
Infections	66	6.3	42	6.9	10	7.1	14	4.7
Congenital Anomalies	160	15.2	49	8.0	49	35.0	61	20.5
Injuries	32	3.0	1	0.2	5	3.6	26	8.7
SIDS	137	13.0	3	0.5	31	22.1	103	34.6
Cardiac-Resp Arrest, Unk	74	7.0	46	7.6	8	5.7	20	6.7
Other	109	10.4	35	5.7	20	14.3	54	18.1
All Causes	1,050	100	609	100	140	100	298	100
White								
Perinatal Conditions	727	32.1	622	62.9	43	11.5	54	6.1
Infections	127	5.6	59	6.0	16	4.3	52	5.9
Congenital Anomalies	660	29.2	166	16.8	212	56.5	278	31.5
Injuries	75	3.3	1	0.1	11	2.9	63	7.1
SIDS	303	13.4	8	0.8	46	12.3	249	28.2
Cardiac-Resp Arrest, Unk	140	6.2	88	8.9	11	2.9	39	4.4
Other	231	10.2	45	4.6	36	9.6	148	16.8
All Causes	2,263	100	989	100	375	100	883	100

Percent may not add up to 100 due to rounding.
SIDS - Sudden Infant Death Syndrome, VLBW - Very Low Birth Weight, MLBW - Moderate Low Birth Weight, Not - LBW - Not Low Birth Weight

one-third for infants of white mothers. The reverse pattern is seen with congenital anomalies which account for nearly 30 percent of white infant deaths, yet slightly over 15 percent for black infant deaths. Differences are not as great for the other NIMS categories by race.

Regardless of birth weight grouping, perinatal conditions, injuries and other causes accounted for a higher percentage of infant deaths for blacks than whites. Congenital anomalies accounted for a larger percentage of white infant deaths than for blacks, regardless of birth weight group. The above differences basically reflect the fact that black women are three times more likely to have VLBW infants than white women and the strong association of VLBW with perinatal conditions and infant mortality.

Table 2 presents total and race-specific risk of infant mortality by birth weight and NIMS groupings of underlying causes of death. Risk is used instead of rate

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because the data is for a birth cohort, rather than for births and deaths occurring in a given year.

The greatest risk of infant mortality was observed for perinatal conditions followed by congenital anomalies regardless of race. This pattern is also observed for VLBW infants but not the other two birth weight groups. The greatest risk of infant death for all races for MLBW was congenital anomalies followed by SIDS. For not-

Table 2. Total and Race-Specific Infant Mortality Risk by Birth Weight and Underlying Cause of Death: 1994-1999 Missouri Resident Birth Cohort

Cause of Death	All Infant Deaths	VLBW Deaths	MLBW Deaths	Not-LBW Deaths
All Races				
Perinatal Conditions	2.75	176.32	2.18	0.18
Infections	0.44	16.68	0.93	0.16
Congenital Anomalies	1.88	35.98	9.54	0.84
Injuries	0.24	0.33 *	0.57 *	0.22
SIDS	1.01	1.80 *	2.79	0.87
Cardiac-Resp Arrest, Unk	0.50	22.57	0.71	0.15
Other	0.79	13.25	2.11	0.51
All Causes	7.61	266.93	18.83	2.93
Black				
Perinatal Conditions	7.00	214.14	2.37 * NS	0.34
Infections	0.98	20.77 NS	1.39 * NS	0.24 * NS
Congenital Anomalies	2.37	24.23	6.82	1.05 NS
Injuries	0.47	0.49 * NS	0.70 * NS	0.45
SIDS	2.03	1.48 * NS	4.32	1.77
Cardiac-Resp Arrest, Unk	1.10	22.75 NS	1.11 * NS	0.34
Other	1.62	17.31	2.78	0.93
All Causes	15.58	301.19	19.49 NS	5.12
White				
Perinatal Conditions	1.98	156.20	2.13	0.16
Infections	0.35	14.82	0.79 *	0.15
Congenital Anomalies	1.80	41.69	10.50	0.81
Injuries	0.20	0.25 *	0.55 *	0.18
SIDS	0.83	2.01 *	2.28	0.73
Cardiac-Resp Arrest, Unk	0.38	22.10	0.55 *	0.11
Other	0.63	11.30	1.78	0.43
All Causes	6.17	248.37	18.58	2.58

Risk is risk of death per 1,000 live births for given birth weight by race grouping.
NS 95 percent confidence interval includes 1.0; therefore relative risk is not significant at .05 level.
* Rate is unreliable because of fewer than 20 events.

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LBW infants the greatest risk of infant death for all races combined and blacks was SIDS, while for whites it was congenital anomalies.

The greatest differential in risk of infant death occurs with birth weight. VLBW infants are 91 times more likely to die during infancy than not-LBW infants. Regardless of race, this differential is mostly associated with perinatal conditions as the underlying cause of death. However, the differential in risk of death by birth weight is more extreme for whites (96.3 times) than for black infants (58.8 times) because of the higher mortality risk for not-LBW black infants.

For all causes reviewed but congenital anomalies, the black mortality risk was greater than twice the corresponding risk for the infants of white mothers, with all differences being statistically significant. For perinatal conditions the risk was 3.6 times greater for blacks than whites. However for VLBW infants, the risk of infant mortality was statistically significantly greater for the infants of black mothers for perinatal conditions, other causes and all causes combined than for the infants of white mothers. Conversely, the VLBW infants of black mothers were statistically significantly at less risk of infant death than whites for congenital anomalies.

For MLBW infants, the risk of SIDS was statistically significantly higher for infants of black mothers than for whites. As for the VLBW group, the MLBW infants of black mothers were statistically significantly at less risk of infant death than whites for congenital anomalies. For not-LBW infants, the risk of infant mortality was statistically significantly higher for infants of black mothers than whites for all conditions except infections and congenital anomalies.

In summary, three major NIMS groupings of underlying causes of infant mortality (i.e. perinatal conditions, congenital anomalies, and SIDS) account for nearly 75 percent of all infant deaths regardless of race. Racial differences in distributions of NIMS categories of underlying causes of death are basically due to the fact that black mothers are three times more likely than non-black mothers to have VLBW infants and therefore to have infant deaths associated with perinatal conditions. This is an important fact because 48 percent of infant deaths for this birth cohort (all races) were VLBW in contrast to 58 percent for the infants of black mothers. For there to be major improvements in infant mortality and racial disparity, the etiology of VLBW (i.e., preterm birth) must be better understood.

References:

1) Thirty-fourth Annual Report of the State Board of Health of Missouri 1916 and Bureau of Vital Statistics 1915-1916. Pp 75-76.

2) Buehler, JW, Strauss LT, Hogue CJR, Smith JC : Birth Weight-Specific Causes of Infant Mortality, United States, 1980. Public Health Reports, Vol. 102, No. 2, 162-171. March-April 1987.

Provisional Vital Statistics for July 2001

Live births increased slightly in July as 6,588 babies were born compared with 6,539 in July 2000. However, cumulative births for the 7- and 12- month periods ending with July both show decreases.

Deaths decreased slightly for all three times periods shown below. A total of 3,937 Missourians died in July compared with 4,134 one year earlier.

The **Natural increase** for Missouri in July was 2,651 (6,588 births minus 3,937 deaths). The natural increase was down for the cumulative 7- and 12- months periods ending with July.

Marriages increased in July and January-July, but decreased slightly for the 12 months ending with July .

Dissolutions of marriage decreased for all three time periods shown below. For the 12 months ending with July, the marriage to divorce ratio increased from 1.70 to 1.77.

Infant deaths decreased from 47 to 40 in July. For the 12 months ending with July, infant deaths decreased slightly from 7.7 to 7.6 per 1,000 live births.

PROVISIONAL VITAL STATISTICS FOR JULY 2001

Item	July				Jan.-July cumulative				12 months ending with July				
	Number		Rate*		Number		Rate*		Number		Rate*		
	2000	2001	2000	2001	2000	2001	2000	2001	2000	2001	1999	2000	2001
Live Births	6,539	6,588	13.4	12.9	45,175	44,505	13.8	13.6	77,080	76,179	13.8	13.8	13.6
Deaths	4,134	3,937	8.5	7.7	32,720	32,618	10.0	10.0	54,856	54,072	9.9	9.8	9.6
Natural increase	2,405	2,651	4.9	5.2	12,455	11,887	3.8	3.6	22,224	22,107	3.9	4.0	3.9
Marriages	4,544	4,874	9.3	9.6	25,015	25,302	7.7	7.7	44,066	44,012	8.0	7.9	7.8
Dissolutions	2,085	2,032	4.3	4.0	15,726	14,070	4.8	4.3	25,994	24,808	4.5	4.7	4.4
Infant deaths	47	40	7.2	6.1	337	375	7.5	8.4	593	579	7.3	7.7	7.6
Population base (in thousands)	...	...	5,595	5,642	...	...	5,595	5,642	...	...	5,527	5,575	5,622

* Rates for live births, deaths, natural increase, marriages and dissolutions are computed on the number per 1000 estimated population. The infant death rate is based on the number of infant deaths per 1000 live births. Rates are adjusted to account for varying lengths of monthly reporting periods.